APPROVAL OF MANUALS, PROCEDURES AND CHECKLISTS

GUIDANCE MATERIAL FOR INSPECTORS
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SOUTH AFRICAN

CIVIL AVIATION AUTHORITY

AIR OPERATOR CERTIFICATION

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SECTION 1.
BACKGROUND AND DEFINITIONS

I. INTRODUCTION.

This chapter contains direction and guidance to be used by Operations Inspectors (FOIs) and inspectors for processing, reviewing, and accepting or approving manuals, procedures, and checklists.

Section 1 contains general background information and definitions of the terms used in this chapter.

Section 2 contains guidance for FOIs for approving or accepting an operator's manuals, procedures, and checklists

II. OVERVIEW OF MANUAL REQUIREMENTS.

The Civil Aviation Regulations (CAR) require operators to prepare and keep current various manuals and checklists for the direction and guidance of flight and ground personnel conducting commercial air transportation operations.

CAR 121.04.2 requires that each operator prepare and keep current an operations manual providing operator procedures and policy guidance for all of its personnel. SA CATS 121.04.2 describes the layout and contents of the operations manual. The manual must also include adequate policy, direction, and guidance for the safe and efficient performance of the duties assigned to each category of employee. The CAR only require an operator to produce a single manual. In practice, however, the manual system may require several manuals or volumes, even for relatively simple operations. Operators have wide latitude in structuring their manuals.

III. DEFINITIONS.

The following terms are defined according to their use in this guidance material:

Operations Manual (OM): A manual containing procedures, instructions and guidance for use by operational personnel in the execution of their duties.

Maintenance Control Manual (MCM): A manual containing procedures, instructions and guidance for use by maintenance and other concerned operational personnel in the execution of their duties.

User Manual: A segment of an OM or a MCM that provides instruction, policies, procedures, and guidance to a specific category of employee. Examples of user manuals that are commonly used in the air transportation industry include the following:

- Aircraft operating manuals
- Training programs manuals and Security manuals
- Cabin attendant or cabin service manuals
- Flight dispatch manuals

- Station operations manuals
- Route guides and airport manuals
- Dangerous goods handling manuals

NOTE: The user manual titles previously listed are only examples of common titles currently in use in industry. Inspectors should not interpret this as a list of required titles. Operators may choose to divide the OM in any convenient way and may select different user manual titles.

Aeroplane Flight Manual (AFM):
An approved aeroplane flight manual as required by CAR 121.04.4 is prepared by the manufacturer and approved by the State of aircraft design. This manual may be included in the AOM.

Aeroplane Operating Manual (AOM):
An approved aircraft operating manual is a manual that is developed by, or for, a specific operator for a specific aircraft type and which is approved by the FOI, in accordance with the provisions of CAR 121.04.3. The AOM shall be included in the OM and in terms of CAR121.04.2 (3)(b) must be approved by the CAA.

Policy:
A written requirement established by an operator's management that is expected to be complied with by appropriate employee personnel. A policy may be within a procedure or stated separately. A written requirement such as, "No flight may depart on a cross-country flight without a spare case of FOII" is an example of a policy.

Recommendation:
A preferred technique or action described by the operator which employees are expected to follow whenever practical. A recommendation is not a policy requirement.

Procedure:
A logical progression of actions and/or decisions in a fixed sequence that is prescribed by an operator to achieve a specified objective. In short, a procedure is step-by-step guidance on how to do something.

Abbreviated Procedure:
A list of sequential procedural steps without an amplified description or amplified set of instructions.

Amplified Procedure:
A description of sequential procedural steps with detailed explanatory descriptions and/or instructions accompanying each step.

Technique:
A method of accomplishing a procedural step or manoeuvre.

Checklist:
A formal list used to identify, schedule, compare, or verify a group of elements or actions. Although a checklist may be published in a manual, it is usually intended to be used by itself, so that reference to a manual is made unnecessary. Checklists are usually formatted and presented on paper; however, they may be formatted on electronic or mechanical devices, a checklist may or may not represent an

abbreviated procedure. The items listed on a checklist may be unrelated and may not represent a procedure, such as most "normal" checklists. Abnormal and emergency checklists, however, do represent procedures.

NOTE: Checklists and procedures are often confused. Operators have sometimes titled procedures "expanded checklists" or titled checklists "abbreviated procedures." A procedure is a set of actions or decisions prescribed to achieve a specified objective. A checklist is a physical aid used to overcome the limitations of human memory.

"Normal":
When "normal" is used to describe a procedure or checklist, it refers to a routine operation (without malfunctions).

"Emergency":
When "emergency" is used to describe a procedure or checklist, it refers to a nonroutine operation in which certain procedures or actions must be taken to protect the crew and the passengers, or the aircraft, from a serious hazard or potential hazard.

"Non-normal" or "Abnormal":
When "non-normal" or "abnormal" is used to describe a procedure or checklist, it refers to a nonroutine operation in which certain procedures or actions must be taken to maintain an acceptable level of systems integrity or airworthiness.

"Alternate":
When "alternate" is used to describe a procedure or checklist, it refers to a procedure that may be employed instead of another procedure. Alternate procedures may either be normal, non-normal, or abnormal procedures.

"Supplemental":
When "supplemental" is used to describe a procedure or checklist, it refers to a procedure, which may be employed in addition to a normal, non-normal, or abnormal procedure. Supplemental procedures may either be normal or non-normal procedures.

Phase Checklist:
A checklist used to establish and/or verify aircraft configuration during a specific phase of flight. An example of a phase checklist is an "after takeoff checklist."

Normal Checklist:
A checklist comprised of all of the phase checklists used sequentially in routine flight operations.

"Approved":
When "approved" is used to describe a document, manual, or checklist, it means that a regulation requires CAA approval and that the CAA has evaluated and specifically approved the document, manual, or checklist.

"Accepted":
"Accepted" is used to describe a document, manual, or checklist that does not have, or is not required to have, CAA approval. Only portions of an operator’s manuals are required to have CAA approval. The remaining portions are "accepted" by the CAA. Operators are required to submit the entire operations manual to the CAA for review. If the CAA concludes that an accepted section of the operations manual

is not in compliance, the CAA must formally notify the operator of the deficiency. Upon notification, the operator must take action to resolve the deficiency.

"Document":
A written description of a system, a method, or a procedure; a written statement of authorisations, conditions, or limitations; or a file of information. A document serves as an official record of understanding and agreement between the CAA and the operator, describing the means the operator will use to comply with regulatory requirements. An approved document is not a manual. Relevant information from a document, however, may be extracted and published in user manuals. For example, the Operations Specifications (OpSpecs) are not a manual but an approved document from which information is extracted.

Pilot Flying (P-F):
The pilot who is controlling the path of the aircraft at any given time, whether or not the aircraft is in flight or on the ground.

Pilot Not Flying (P-N-F):
The pilot who is not controlling the path of the aircraft.

Immediate Action:
An action that must be taken in response to a nonroutine event so quickly that reference to a checklist is not practical because of a potential loss of aircraft control, incapacitation of a crewmember, damage to or loss of an aircraft component or system - which would make continued safe flight improbable.

High Workload Environment:
Any environment in which multiple demands on the flightcrew necessitate the prioritising of work functions. For example, IFR operations below 10,000 feet during arrival or departure from a terminal area (including taxiing) are considered to be high workload environments.

Systems Management:
The management of those systems, which sustain the mechanical functions of the aircraft as opposed to the management of the aircraft's thrust, flightpath, or aerodynamic configuration.

Warning:
An instruction about a hazard that if ignored could result in injury, loss of aircraft control, or loss of life.

Caution:
An instruction concerning a hazard that if ignored could result in damage to an aircraft component or system which would make continued safe flight improbable.

IV. DISTRIBUTION AND AVAILABILITY OF MANUALS. CAR 121.04.2

Each operator is required to maintain a complete manual (or set of manuals) at its principal base of operations and to furnish a complete manual (or set of manuals) to the CAA. In addition, each operator must make available or furnish applicable parts of the manual (user manuals) to flight and ground operations personnel who conduct or support flight operations. The manual may be in conventional paper format or in another form that is convenient for the user. Each employee to whom the manual or a user manual is furnished must keep it current. Each employee must have access to appropriate manuals or parts of manuals when performing assigned duties.

V. REVIEW OF MANUALS.

Manuals must be reviewed by FOI and other qualified inspectors to ensure they contain adequate content and are in compliance with applicable regulations, safe operating practices, and the operator's OpSpecs. While FOIs are encouraged to provide guidance and advice to operators in the preparation of their manuals, the development and production of an acceptable manual is solely the responsibility of the operator.

Initial Review.
Before the initial certification of an applicant, a comprehensive review of the applicant's OM, user manuals and MCM must be conducted by the FOI and other qualified inspectors. In addition, those items in the operator's Statement of Compliance that require the operator to develop a policy statement, system, method, or procedure, must be addressed. If user manuals are furnished, those topics that apply to the specific user must be addressed. Each topic must be presented with enough detail to ensure that the user can properly carry out the portion of the policy or procedure for which the user is responsible.

Review of Changes to Manuals.
The FOI should review each revision or proposed revision to a manual. Inspectors should not limit this review to a strict consideration of the change itself but should also consider the impact of the change on the operator's overall manual system, training program, and type of operation. Changes in the operator's OpSpecs should be accompanied by a review of applicable sections of the operator's manual.

Enroute and Ramp (Apron) Inspection.
Inspectors conducting enroute and ramp inspections should review the flight manual and those portions of the OM or MCM carried by the flightcrew for completeness and currency. When a flight is long enough to make it practical, inspectors should review these manuals more in-depth, particularly those sections that are operationally relevant to the flight in progress.

Periodic Review of Manuals.
The continual review of an operator's manuals is necessary because both the aviation environment and the operations conducted by the operator are constantly changing. Each FOI is responsible for developing a surveillance plan for the operator's manual system. At least one portion of the operator's operations manual should be reviewed annually, and the entire operations manual should be reviewed over a period of 1 to 3 years (depending on the complexity of the operation). This periodic review should be planned as a distinct event so that every portion of the manual is systematically reviewed at some time over a 1 to 3 year cycle. This periodic review should be co-ordinated between airworthiness inspectors and other inspectors to ensure an appropriate exchange of information and to avFOId redundant reviews.

VI. FORMAT AND STYLE OF MANUALS.

Each page of a manual must include the most recent revision date. In general, manuals and checklists should be easy to use and understand, and in a format that can be easily revised. When evaluating manuals and checklists for ease of use and understanding, inspectors should consider the following guidance concerning format and style:

Form.

All or part of a manual may be prepared and maintained in conventional paper format (book form) or in other forms, such as microfilm or computer based storage with electronic image.

Administration and control of operations manual

(1) The introduction should contain the following:

- A statement that the manual complies with all applicable CARs and with the terms and conditions of the applicable operating certificate.
- A statement that the manual contains operational instructions that are to be complied with by the relevant personnel.
- A list and brief description of the various parts, their contents, applicability and use.
- Explanations and definitions of terms and words needed for the use of the manual.

(2) The system of amendment and revision should contain the following:

- Who is responsible for the issuance and insertion of amendments and revisions.
- A record of amendments and revisions with insertion dates and effective dates.
- A statement that handwritten amendments and revisions are not permitted except in situations requiring immediate amendment or revision in the interests of aviation safety.
- A description of the system for the annotation of pages and their effective dates.
- A list of effective pages.
- Annotation of changes (on text pages and, as far as practicable, on charts and diagrams).
- Temporary revisions.
- A description of the distribution system for the manuals, amendments and revisions.

Revision Control.
Each manual should be easy to revise. Also, each manual should contain a revision control page or section from which the user can readily determine whether the manual is current. This page or section should preferably follow the preface page but it can be organised in any logical manner. The control date of the most recent revision of each individual page must appear on each page. Complex operators should establish a bulletin system to bring temporary information or changes that should not be delayed by a formal revision process, to the attention of the user. The bulletin system should have a means of control that includes giving bulletins a limited life and systematically incorporating them into appropriate manuals in a timely manner. Users should be able to easily determine whether they possess all current bulletins.

Table of Contents.
Each manual should have a table of contents containing lists of major topics with their respective page numbers.

References.
Manuals must include references to specific regulations when appropriate. A reference to regulations or other manual material is appropriate when it is necessary to clarify the intent of the text or when it is useful to the user for looking up specific subject matter. References should not be made to advisory documentation, as these sources are advisory only and not binding in nature. Operators should use caution when adapting the text of advisory documents into their manuals. Advisory text may not translate into a directive context.

Definitions.

Significant terms used in manuals should be defined. Any acronym or abbreviation not in common use should also be defined.

Elements of Style.

Manuals and checklists should be composed in the style of general technical writing. This style should be clear, concise, and easy to understand. When evaluating manuals, inspectors should be knowledgeable of the following suggestions for accomplishing clarity in technical writing:

1. Whenever possible, short, common words should be used. Examples of this include: using the words "keep" or "hold" instead of "maintain"; using the word "start" instead of "establish"; and using the word "stop" instead of "terminate."

2. When a word has more than one meaning, the most common meaning should be used. For example, the word "observe" should be used to mean "see and take notice of" rather than "obey and comply."

3. Operators should standardise terminology whenever practical. For example, since the terms "throttles" and "thrust levers" refer to the same item, the operator should choose one term and use it consistently throughout the manual. Once a particular term has been used in a specific sense it should not be used again in another sense.

4. Terms which command actions should be clearly defined, such as "checked," "set," and "as required." Since auxiliary verbs such as "may" and "should" are ambiguous and can create room for doubt, they should not be used when a definite action is commanded. Instead, verbs such as "shall" and "must" are preferable to use when an action is commanded, because they are more definite.

5. All "instructions" should be given in the imperative mood and the active vFOIce. For example, "Hold the speed between Vref and Vref plus 10 knots" is preferable to "The speed needs to be held between Vref and Vref plus 10 knots."

6. To provide appropriate degrees of emphasis on specific pFOInts in the text, "cautions," "warnings," and "notes" should be in the operator's manuals and checklists.

7. Any instruction, particularly a warning or a caution, must begin with a simple directive in the imperative mood that informs the reader precisely what must be done. To avFOId obscuring the directive in the background information, the directive must be stated first and then followed with an explanation. An example of how a directive can be obscured in background information is as follows: "Warning - To avFOId the hazard of striking ground handling personnel with the free end of a swinging tow bar, do not place feet on rudder pedals until the captain takes the salute from the ground handler. The hydraulic nose wheel steering can sling the tow bar with hazardous force." In contrast the following is an example of the preferred method of placing the directive first: "Warning - Do not place feet on rudder pedals until the captain takes the salute from the ground handler. The hydraulic nose wheel steering can sling a tow bar with sufficient force to cause serious injury to ground handling personnel."

8. Descriptions in the manual should not be overloaded, but should be presented simply and sequentially. An example of an overloaded description is as follows: "A CSD per engine drives the AC generator at a constant speed of 8,000 RPM regardless of the speed of the engine or the load on the generator." The following is an example of a clearer, more concise description: "A CSD is mounted between each engine and generator. The CSD holds the generator speed at a constant 8,000 RPM."

9. Long sentences should be avFOIded in the manual. The following example consists of subject matter put into a long sentence which makes it difficult to understand: "During gear retraction, the door operating bar located on the landing gear leg contacts and turns the latch, withdrawing the roller from the slot as a second roller entraps the door operating bar." The following example consists of the same subject matter used in the previous example, however, when it is broken down into shorter sentences, it is easier to understand: "During landing gear retraction, the door operating bar on the landing gear leg is pressed against the door latch. The latch turns, freeing the door roller. The roller moves out of the slot. A second roller then traps and holds the door operating bar."

VII. ADEQUACY OF PROCEDURES.

The following general guidance is provided for inspectors to use when evaluating procedures in any manual, including flight manuals:

Objective.
The objective of a procedure must be stated clearly unless it is so commonly understood that a statement of the objective is not necessary.

Logical Sequence.
Procedures are to flow in a logical step-by-step sequence. The most effective procedures are usually simple and each contains only the information necessary for accomplishing that procedure. Preferably procedures should be described in a sequential step-by-step format rather than a narrative format.

General Considerations.

1. A procedure must be an acceptable method for accomplishing an intended objective.

2. The individual responsible for each step of a procedure must be clearly identified.

3. The acceptable standards of performance for a procedure are to be stated if those standards are not commonly understood or clearly obvious.

4. Since a variety of personnel with differing degrees of expertise are involved in procedures, adequate information concerning the accomplishment of a procedure must be provided for the least experienced individual. A procedure may be described very briefly and concisely when the user is capable of achieving the objective without extensive direction or detail. When the user has limited training or experience, however, a procedure must be described in enough detail for the user to correctly accomplish it. When the user has limited access to other sources of information and guidance while performing a procedure, enough detail should be provided to make the user independent of other sources of information.

5. When a form, checklist, or tool is necessary to accomplish a procedure, the location of that item must be indicated in the procedure.

6. Enough time should be available under normal circumstances for the user to accomplish a procedure. If sufficient time is not available to the user for accomplishing a procedure, either the procedure itself or the user's duties must be revised.

CHAPTER 2.
APPROVAL AND ACCEPTANCE OF MANUALS AND CHECKLISTS

I. GENERAL.

This section contains direction and guidance for FFOIs when approving or accepting an operator's manuals and checklists. This process is based on the general process for approval or acceptance

The Approval Process.
The approval process for an operator's checklist normally consists of phases one, two, three, and five of the general process. It may be necessary, however, for an FOI to require that phase four (the demonstration and inspection phase) be included in the approval process.

The Acceptance Process.
The acceptance process for a manual or manual section normally consists of phases one, two, and three of the general process. The operator must submit to the FFOI current copies of required manuals for CAA review. An operator's entire manual system must be reviewed during the document evaluation phase of initial certification. Once an operator is certified, the operator may revise, distribute, and use accepted material even though the FFOI has not completed a review of it. If after review, the FOI determines that portions of the manuals or checklists are unacceptable, the operator must revise the unacceptable portions after notification by the FFOI.

Evaluation of Manuals for CAA Acceptance or Approval.
An operator may develop and publish in its manual any policy, method, procedure, or checklist that the operator finds necessary for the type of operations conducted. These policies, methods, procedures, and checklists, however, must comply with the CAR and be consistent with safe operating practices. FOIs should encourage operators to be innovative and progressive in developing such policies, methods, procedures, and checklists. The FOI's role in the review process is to provide an independent and objective evaluation of the operator's manual material. The FFOI must ensure that the operator's material complies with the CAR, is consistent with safe operating practices, and is based on sound rationale or demonstrated effectiveness.

Discrepancies.
When an FFOI finds a discrepancy in an operator's existing manual material, the FOI shall take action to have that discrepancy resolved. Usually such discrepancies can be resolved through informal discussions. When informal discussion cannot resolve the discrepancy, however, the FFOI is required to formally withdraw CAA approval or acceptance from the operator.

VIII. ESTABLISHING A FRAMEWORK FOR REVIEW.

Methods for Manual or Checklist Organisation.
During the Pre-application phase, the FOI should inform the operator that there are various methods that can be used to organise and format manuals, manual sections, and checklists requiring CAA approval/acceptance. The FOI may inform the operator of the content of the following subparagraphs, which describe at least four possible methods that an operator may use:

1. Limited Content. An operator may choose to limit the content of the manual solely to approved material. When this method is used, the entire manual must be approved and the operator may not revise the manual without additional review by the FOI. While this method facilitates CAA review and acceptance, the manual may be difficult to use because the intended user may have to frequently switch back and forth between the approved checklists and other manuals containing accepted material. When the operator chooses this method, FOIs must ensure that a header or footer is on each page indicating the material is CAA approved.

2. Grouping Material. An operator may choose to group the CAA approved material in specified sections of the manual and place accepted material in the remaining sections. With this method, the FOI must ensure that a header or footer is on each page of the approved sections indicating that the material on that page is CAA approved. The operator may submit the approved and accepted sections to the FOI as separate packages.

3. Interspersed Material. An operator may choose to intersperse CAA approved material and accepted material throughout the manual. When an operator chooses this method, the FOI must ensure that the operator has clearly identified approved material each time it appears in the manual. This method of organisation allows for efficient manual use, but makes the operator's publication process and the approval process difficult.

4. "Approval Document". The operator may choose to place material in an "approval document" solely for the purpose of obtaining CAA approval of that material. An approval document is a document and therefore may not be used as a manual. After the document has been approved, the operator must develop user manuals, which incorporate the approved information from the document along with detailed, guidance and supplementary information. When this method is used, the user manuals are treated as "accepted" material and do not have to be individually approved. The FOI must, however, review the user manuals to ensure that the information in them is consistent with the approval document. When using this method, the operator may revise the information in user manuals without prior CAA approval, provided the revision is consistent with, and does not conflict with, the information in the approval document. If the operator or the FOI finds it necessary for the approval document to be revised, the operator must submit the proposed revision for review and approval. A revision to an approval document must be approved before the operator can incorporate the changed information into the user manuals. When an operator uses this method for submitting manual or checklist material for CAA approval, FOIs must ensure that the operator has stated on the first page of the user manuals that the manual contains CAA approved material. The manuals or checklists provided to the user, however, do not have to be specifically identified as being CAA approved ones.

   Submission of Material. During the Pre-application phase, the FOI should advise the operator on how to submit the documents, manuals, checklists and subsequent revisions for approval or acceptance.

5. CAA Approval Submission. For material that requires CAA approval, the FOI should advise the operator to submit the following:

   - Two copies of the document, manual, manual section, checklist, or revision to be approved; one copy of the printed version of the electronic checklist (as applicable); one copy of a report indicating differences between the proposed and current versions of the electronic checklist (as applicable); or
   - One copy of the document, manual, manual section, checklist, or revision, and two copies of the page control sheets for the material (the page control sheets, must show

an appropriate revision number or original page number for each page, and the effective date of each page)
- A copy of any supporting documentation or analysis

6. CAA Acceptance Submission. For material that is to be evaluated for acceptance by the CAA, the FOI should advise the operator to submit the following:

    - A copy of the manual, manual section, checklist, or revision to be reviewed.
    - A copy of the page control sheets for the material to be reviewed when appropriate.

7. The FOI will perform a cursory review of submissions. This review is intended to ensure that the applicant's submission is clear and contains all required documentation. This review is performed before the in-depth review.

IX. PHASE THREE: IN-DEPTH REVIEW.

A detailed analysis of the operator's submission is performed during the document evaluation phase. During this phase, a qualified inspector must review the operator's submission in detail to determine that the submission is complete and technically correct. The time to complete phase three depends on the scope and complexity of the submission. During the cursory review, the FOI should determine how long the in-depth review will take. The FOI shall give the operator an estimate of the time it should take to complete the review process at the formal application meeting.

Review Standards.
The review and analysis should confirm that the operator's submission conforms to, or is consistent with, the following:

- Model Civil Aviation Regulations (CAR).
- Criteria and guidance in this document.
- The operator's OpSpecs.
- Criteria and guidance in CA AOC-001.
- Applicable aircraft flight manuals, manufacturer's operating bulletins, and airworthiness directives.
- Safe operating procedures.
- The operator's cockpit resource management policies.

NOTE: The direction and guidance in this chapter for reviewing procedures and checklists have been developed after consultation with knowledgeable and experienced personnel in the international air transportation industry, aircraft manufacturers, and the CAA. The information presented is considered to be the best guidance currently available on the topic. The best set of procedures for one circumstance may not work well in another circumstance. Two recommendations may be in conflict. In such cases, the appropriate resolution must be achieved through compromise. For example, it may be more important for an operator's checklist and procedures design policies to be internally consistent than for an individual procedure to be designed in a specific way.

Operator's History
The FOI should thoroughly consider the operator's experience and history when evaluating procedures and checklists. When an operator has a history of successful operations, the FOI should normally approve submissions consistent with the operator's existing procedures.

Verification Tests
The FOI may require verification tests of some procedures and checklists before grating approval.

1. These verification tests may be conducted in either phase 3 or 4 of the certification process. For example, verification of an aeroplane checklist would occur in phase 3 of the process to permit the applicant to commence flight training.

Review of electronic checklist modifications
Applications with the ability to automatically detect the completion of an action shall include verification that detection is based on monitored conditions that are consistent with the objective of the action (for example, a checklist action item for LANDING GEAR ... DOWN would show complete on the sensing of the gear handle being down and the gear indication being down). The review and verification should be accomplished using a paper copy of the electronic checklist annotated with the monitored condition for each action whose completion is automatically detected.

X. GRANTING CAA APPROVAL.

The FOI grants CAA approval to manuals, manual sections, and checklists. During this phase the FOI must formally notify the operator of the approval and also complete a specific record of the approval. For manuals and manual sections, which are not required to have CAA approval, written notification of acceptance is not required and shall not be given.

Notification of Approval.
When the FOI decides to approve a document, manual, manual section, or checklist, the following procedures apply:

1. For a document, manual, or checklist that contains page control sheets, the FOI shall annotate both copies of the page control sheets with the phrase "CAA Approved." Under the words "CAA Approved," FOIs shall enter the effective date of approval and sign both copies. The operator may pre-print the words "CAA Approved" and blank lines for the date and signature on the page control sheets or the FOI may use a stamp to add the approval annotation on each sheet.

2. For manuals, manual sections, or checklists that do not contain page control sheets, the approval annotation must be placed by the FOI on each page of the material. In this case the approval annotation must be made on two copies of the material. The annotation shall be the same as discussed above. This procedure should be used only for very short manuals, manual sections, or checklists (usually fewer than 5 pages) or when the use of page control sheets is not practical or serve little purpose.

3. When page control sheets are used, the FOI shall return one copy of the annotated page control sheets to the operator. In the remaining cases one copy of the approved material must be returned to the operator with a notification letter stating that the material is approved. The letter should also contain a statement advising the operator to maintain, for its records, the signed page control sheets or the material with the approval annotation. The FOI shall retain the second copy of the signed page control sheets, or the annotated material, in the district office files.

4. When electronic checklists are submitted for approval, the operator will prepare a release/cover sheet for the printed version of the electronic checklist. The release/cover sheet will contain the pre-printed words and lines as discussed above. The FOI's annotation shall be the same as discussed above.

Notification of Disapproval.
The co-ordination, revision, and editing activities that take place throughout all phases of the process should eventually result in approved products. Under certain circumstances, however, it may be appropriate for the FOI to terminate the process. For example, the operator may not take any action on the material for 30 days. To terminate the approval process, the FOI shall return the entire submission to the operator with a letter that states that the CAA is unable to grant approval, along with the reasons why it cannot be granted.

District Office Records. (when activated)
The FOI shall maintain a record of approval for each operator-submitted document, manual, manual section, and checklist. Records of approval to revisions of this material must also be maintained. The records should consist of page control sheets, notification letters, and any other related correspondence. While superseded portions of documents, manuals, or checklists do not have to be retained, FOIs may retain this type of material if they determine that it is appropriate. The FOI should include with the material in the operator's file a brief memorandum containing the reasons for retaining the material.

Appendix 1 Manuals, Procedures, And Checklists

Aircraft Checklists

General. This section contains direction and guidance for operations inspectors (FOI) for the review of aircraft checklists for Civil Aviation Regulations (FAR) Parts 121 and 135 operators. In terms of CAR 121.07.2 and 135.07.2 all Parts 121 and 135 operators must provide aircraft checklists to their flight crewmembers. Flight crewmembers are required to use these aircraft checklists in commercial operations. For Part 121 operators, aircraft checklists must be approved by the CAA, and for Part 135 operators these checklists must be acceptable to the CAA (see section 1 of this chapter for definitions of acceptance and approval).

A. Definition. A checklist is a formal list used to identify, schedule, compare, or verify a group of elements or actions. A checklist is used as a visual or oral aid that enables the user to overcome the limitations of short-term human memory. Although a checklist may be published in a manual, it is designed for independent use so that the user does not have to reference a manual. Checklists are used to ensure that a particular series of specified actions or procedures are accomplished in correct sequence. Aircraft checklists, in particular, are used to verify that the correct aircraft configuration has been established in specified phases of flight.

B. Standardization. Aircraft checklists and the operator’s policies for the use of checklists are one means by which operators structure and define flight crewmember roles. Research has shown that standardized procedures and effective cockpit communications are significant factors in flight safety. FOI’s must review the operator’s policies and procedures for checklist use as an integral part of the checklist review process. FOI’s shall ensure that checklists and the operator’s procedures for checklist use are standardized (to the extent allowed by individual aircraft differences) for all aircraft in the operator’s fleet.

C. CAA Approval or Acceptance for Specific Operators. When a FAR Part 121 operator proposes to use an AFM checklist, the FOI must review and approve that checklist for that operator. When a FAR Part 135 operator proposes to use an AFM or checklist, the FOI must review the checklist and determine that it is acceptable for that operator's use.

Checklist Content. Aircraft checklists have traditionally been divided into three categories. For the purpose of this handbook, these categories are referred to as normal, non-normal, and emergency. Operators may use other titles for these categories, such as abnormal instead of non-normal. Operators may also further divide these categories into subcategories, such as alternate and supplemental. FOI's shall use the following guidance when evaluating the content of an operator's checklists.

A. Content. FOI's shall ensure that aircraft checklists are limited to action items or verification items. The aircraft checklist should not contain elaboration or explanation. FOI's must ensure that the required actions and decisions for flightcrews when performing a checklist are thoroughly described in the operator's manual and training program. FOI's should consider the following when evaluating aircraft checklist content:

(1) Non-normal and emergency checklists must contain each sequential step of a procedure.

(2) A normal checklist is typically a listing of action items to be performed and verified at a particular point in flight. Normal checklist items do not necessarily represent a procedural step and may even represent completion of an entire procedure. For example, the item "Gear - Up and Locked" could indicate that the gear handle had been raised, the gear indications checked, the gear handle had been placed in the neutral position to check the up-locks, and that the handle had then been returned to the up position. Most normal procedures do not require itemization or incorporation into a checklist. For example, the procedures for making normal takeoffs and landings are not itemized in a checklist format but described in a narrative format.

B. Criticality of Checklist Items. Checklist items can be ranked in criticality according to the potential effect of the crewmember failing to perform the action. Critical items are those items, which, if not correctly performed, have a direct, adverse effect on safety. Non-critical items are "housekeeping" items or systems management items, which for operating practices must be routinely accomplished during a specific phase of flight, but if omitted would have a minimal effect on safety. An item may be considered to be critical on one checklist but non-critical on another checklist. For example, a flight-crew's failure to set the flaps while accomplishing the before-takeoff checklist has had extremely adverse consequences. A flight-crew's failure to retract the flaps while performing the after-landing checklist, however, has had little effect on safety. The operator and PFOI shall analyse each phase of flight to identify critical items for that phase of flight and to ensure that all critical items are included on the checklist.

C. Diversion of the Flight-crew's Attention. The flight-crew's attention is diverted from other tasks when performing a checklist. Checklists must be kept as short as practical to minimize "heads-down" time and diversion of the crew's attention while performing the checklist.

(1) Each additional item that is added to a checklist increases the potential for interruption when the checklist is accomplished, diversion of the crew's attention at a critical point, and the missing of critical items. Operators and FOI's must weigh the benefit of including each item on a checklist against the possible adverse effects.

(2) Items not associated with aircraft operations (such as calls to the company) shall not be placed on the checklist.

D. Aircraft Sophistication and Checklist Design. The degree of technological sophistication in the design of the aircraft directly affects checklist items. In older aircraft, the flight-crew must manually select and monitor most items. In technologically advanced aircraft, the same items are accomplished and monitored by automatic systems that relieve the flight-crew of these tasks. Checklists for technologically advanced aircraft tend to be shorter and simpler than those for older aircraft. FOI's shall ensure that the operator's aircraft checklists are based on a careful task analysis of the operational requirements of the specific aircraft.

E. Fleet Standardization. FOI's shall ensure that operators standardize checklist items and the sequence of items to the extent allowed by individual aircraft differences across all aircraft in the fleet. Checklists for technologically sophisticated aircraft are typically shorter and simpler than those for older aircraft. The items on checklists for technologically advanced aircraft, however, are normally present on checklists for aircraft with older technology. FOI's shall require operators to evaluate the feasibility of placing common checklist items on checklists with standard titles for all aircraft (such as before-start, before-takeoff, or before-landing checklists). Items should appear in a standard sequence to the degree possible. FOI's should not normally approve placing an item on a checklist that is not required for that specific aircraft solely because the item is required in other aircraft of the fleet. FOI's may make exceptions, however, when the operator provides adequate justification.

Methods Of Checklist Design. Operators may choose from at least two accepted methods of checklist design: the "challenge-do-verify" (CDV) method and the "do-verify" (DV) method. Available evidence suggests that safety is enhanced when the operator adopts and applies a consistent checklist design policy. FOI's should use the following informative guidance when reviewing the design of an operator's aircraft checklists.

A. "Challenge-Do-Verify." The CDV method consists of a crewmember making a challenge before an action is initiated, taking the action, and then verifying that the action item has been accomplished. The CDV method is most effective when one crewmember issues the challenge and the second crewmember takes the action and responds to the first crewmember, verifying that the action was taken. This method requires that the checklist be accomplished methodically, one item at a time, in an unvarying sequence. The primary advantage of the CDV method is the deliberate and systematic manner in which each action item must be accomplished. The CDV method keeps all crewmembers involved (in the loop), provides for concurrence from a second crewmember before an action is taken, and provides positive confirmation that the action was accomplished. The disadvantages of the CDV method are that it is rigid and inflexible and that crewmembers cannot accomplish different tasks at the same time.

B."Do Verify." The DV method (or "clean-up" method) consists of the checklist being accomplished in a variable sequence without a preliminary challenge. After all of the action items on the checklist have been completed, the checklist is then read again while each item is verified. The DV method allows the flight-crew to use flow patterns from memory to accomplish a series of actions quickly and efficiently. Each individual crewmember can work independently, which helps balance the workload between crewmembers. The DV method has a higher inherent risk of an item on the checklist being missed than does the CDV method.

C. Selection of Design Method. Both the CDV and the DV methods of checklist design are currently being successfully used for normal checklists. Traditionally, operators have preferred the DV method

for normal checklists and the CDV method for non-normal and emergency checklists. Operators have, however, successfully used the CDV method for all checklists. FOI's may approve either method for normal checklists. In most circumstances non-normal and emergency checklists are more effective when the CDV method is used. The correct accomplishment of the actions and procedures incorporated in the non-normal and emergency checklist categories is critical and warrants a methodical approach. Since these checklists are seldom used, however, crewmembers are usually not as familiar with the procedures incorporated into these checklists, as they are with the procedures in normal checklists. In addition, many non-normal and emergency checklists do not lend themselves to developing flow patterns that crewmembers can readily recall. The CDV method also enforces crew coordination, cross-checking, and verification, all of which aid the crewmember in overcoming the adverse effects of stress. FOI's should not approve or accept the DV method for non-normal or emergency procedures unless the operator can provide substantial evidence that the method is effective for this application.

D Mechanical or Electronic Checklists. Mechanical or electronic devices differ in format from paper, hand-held checklists, but not in the design method or use. The actions these checklists contain and their sequencing shall be consistent with the paper version (when required) available to the flight-crew. Some electronic checklists will have an ability to automatically detect the completion of an action based on switch position, system state, or both. In electronic checklists, the verification in the CDV or DV methods may be a matter of observing that the items are complete via the display method used (for example, completed items turn green). The CDV or DV methods can be applied to any type of checklist. FOI's should encourage the use of such aids when operators find them effective.

E. Verification. FOI's should keep in mind that all checklist designs are subject to human error. Crew members may omit and skip checklist items. Crew members may erroneously respond to a checklist at times believing that an item or task was accomplished when it was not. At times, crew members may see what they expect to see rather than what has actually been accomplished. Both the CDV and the DV methods are subject to such human errors. FOI's must ensure that operators have developed policies for using checklists that require stringent cross-checking and verification to overcome these human limitations. These policies must be compatible with the operator's crew resource management (CRM) philosophy. FOI's shall review the operator's policies as an integral part of the review process.

Policies For Managing The Accomplishment Of Checklists.

FOI's must ensure that the appropriate sections of the operator's manuals contain the specific crewmember responsibilities for monitoring, verifying, and managing the accomplishment of checklists. These responsibilities should appear either as policy statements or as specific directives. FOI's should use the guidance that follows when evaluating an operator's policies for the accomplishment of checklists.

A. Objective of Policy Statements and Directives. The primary objective of the operator's policy statements or directives is to standardize crewmember interaction. These statements should include, but not be limited to, the following items:

- Flightcrew responsibilities for maintaining aircraft control, analysing situations, and for requesting the appropriate checklist in non-normal and emergency situations
- The specified crewmember responsible for initiating each checklist
- The specified time when each checklist is to be initiated
- The specified crewmember responsible for accomplishing each item on the checklist
- The specified crewmember responsible for ensuring that each checklist is completed and for reporting that completion to the crew

• Crewmember responsibilities for bringing to the attention of the pilot-in-command (PIC) and the rest of the crew any observed deviation from prescribed procedures

B. Methods for Managing Checklist Accomplishment. The following subparagraphs each contain a discussion of recommended methods an operator may use for managing checklist accomplishment. These methods are not all-inclusive and may not meet all of the operator's needs. FOI's shall not interpret these methods as the only ones that are acceptable.

(1) For single-pilot aircraft, the CAA recommends that operators mount the before-takeoff checklist and the before-landing checklist on the instrument panel by means of a placard. When aircraft characteristics allow, the operator should develop touch-verification procedures that contain a requirement that the pilot touch each control to verify it is in the correct position.

(2) For two-pilot aircraft in which only the PIC has ground steering control, the recommended method for accomplishing checklists is for the second-in-command (SIC) to read all checklists when the aircraft is in motion on the ground. The recommended method for those aircraft in which either pilot can steer on the ground is for the pilot-not-flying (PNF) to read all checklists. In all two-pilot aircraft, the PNF should read all checklists when the aircraft is airborne.

(3) For three-crewmember aircraft, the recommended method is for the SIC to read the flight engineer (FE) portion of the before-engine-start checklist, so that the PIC can observe and verify the configuration of the FE panel as the FE responds to each item on the checklist. Since the PNF is the crewmember most subject to interruptions from radio communications, it is recommended that the FE should read all normal checklists and verify that each pilot action has been taken when the aircraft is in motion. The FE should have the explicit task of verifying that critical items have been performed by the pilots, whether or not the FE has verbal responses for those items. In those non-normal or emergency situations that involve significant activity by the FE, it is recommended that the PNF read the checklist and verify FE actions while the FE performs and responds to the items.

(4) For all aircraft, the crewmember responsible for reading the checklist should be responsible for ensuring that the checklist is completed systematically and expeditiously. This crewmember should be responsible for managing interruptions, cross-checking controls and indicators to ensure that the required actions have been accomplished, and for reporting that the checklist has been completed.

(5) The pilot-flying (PF) should not be distracted from controlling the aircraft to perform a checklist item that another crewmember can accomplish. The PF should activate only those switches or controls (other than the manual or automatic flight controls, throttles, and nosewheel steering) that are not within practical reach of another crew-member. Only one pilot should be "heads down" at any time.

(6) In the pre-start phase, flight guidance and navigation checklist items have proven to be critical items. A response should be required from both pilots (and FE, if applicable) when the same setting is required for more than one device (such as computers, flight instruments, and altimeters). Inertial platform alignment and computer programming should be accomplished by one crewmember and independently confirmed by another crewmember. As many of these checklist items as possible should be accomplished and verified before the aircraft is moved.

(7) In the taxi and pre-takeoff phases, aircraft configuration (such as flaps, trim, and speedbrakes) and flight guidance items (such as heading, flight-director, altitude select panel settings, and airspeed bugs) have proven to be critical. All flight crewmembers should confirm these items, and at least two crewmembers should respond to applicable checklist items.

(8) On approach, flight guidance checklist items have proven to be critical items. At least two crewmembers should confirm and respond to these items. A response should be required from each pilot when the same setting is required on two separate devices (such as computers, flight instruments, or altimeters).

NOTE: One operator was able to reduce altitude deviations from an average of two per week to one per quarter by using stringent procedures for setting and verifying the altitude alerter.

(9) All checklist items that are critical in the before-landing phase vary with the type of airplane involved. In the operation of small airplanes, the landing gear has proven to be a critical checklist item, and both pilots should confirm and respond to this item. Although the landing gear and flaps are critical items for large, transport category airplanes, the multiple warning devices and systems that are associated with these systems make the need for a response and confirmation by both pilots less critical.

(10) All checklists, except the after-takeoff and after-landing checklists, should be accomplished by one crewmember reading the checklist items and a second crew-member confirming and responding to each item. FOI's shall ensure that critical items on the before-takeoff and before-landing checklists are confirmed and responded to by at least two crewmembers.

(11) All checklists must be designed so that the flight-crew can maintain an adequate visual scan and monitor air traffic control (ATC) communications while simultaneously controlling the aircraft. The recommended method is for the operator to group the systems management checklist items after the configuration, thrust, and flight guidance items for each phase of flight. When systems management checklist items must be accomplished in a high workload environment, it is recommended that they be accomplished by a single crewmember. Usually the after-takeoff and after-landing checklists items can be accomplished silently as these items have not proven to be critical. FOI's should carefully evaluate the operator's overall operation and experience before approving other checklists in which a single crewmember may accomplish a checklist.

(12) Operators should direct crewmembers to refrain from accomplishing action items assigned to other crewmembers. Crewmembers should be directed that when they observe that another crewmember is not taking or has not taken a required action they must inform the crew-member, the PIC, or the whole crew, as appropriate.

(13) Checklists should not be depended on to initiate changes in aircraft configuration. Operators should key aircraft configuration changes to specific operational events. For example, the operator may direct the landing gear to be extended at glideslope intercept. For any adjustment of thrust, or configuration, a command from the PF and an acknowledgement from the crewmember taking the action is required.

(14) Flight crewmembers frequently cannot complete a checklist when initiated either because of an interruption or because an item on the checklist has not yet been accomplished. FOI's shall ensure that each operator has developed policies for the management of these situations. For short delays, the recommended policy is for the flight-crew to hold the checklist until the interruption is over and the item can be completed. When the checklist item is completed, the challenge should be repeated, the proper response given, and the checklist continued. FOI's shall not accept policies that allow flight-crews to skip checklist items that have not been completed and then to depend on memory to accomplish the item later. When a mechanical or electronic device allows checklist items to be accomplished in a random sequence, the FOI may allow policies appropriate to the system used.

C. Checklist Interruptions. Operators must establish procedures to ensure that the correct checklist sequence is re-established when unusual events interrupt the normal sequence of a flight. For example, crewmember actions during normal sequences of flights are interrupted when long delays are encountered on taxi-out or when crewmembers vacate the flight deck.

(1) Verification of Items Accomplished. The flight-crew must verify the accomplishment of all items on checklists that have been accomplished up to the point where the current checklist was interrupted.

(a) Minimum Requirement. As each checklist item is re-accomplished, the minimum that is required is a verification that switches, control handles, knobs, or levers are in the positions prescribed and that the associated indicator lights and instrument readings confirm the proper positioning of the applicable switches, control handles, knobs, or levers.

(b) Additional Requirements.

1. If the verification check reveals that any switch, control handle, knob, or lever is not in the position prescribed, then the full procedure, including any associated checks for the particular checklist item(s), must be re-accomplished.

2. If the indicator lights or instrument readings associated with the proper positioning of particular switches, control handles, knobs, or levers are not in agreement with the prescribed positions of these control means and re-accomplishment of the full procedure, including any associated checks for the particular checklist item(s), does not correct the disagreement, then the flight-crew must log the discrepancy in the aircraft maintenance log. The operator must either correct this discrepancy before the next flight or, if permitted, defer correction in accordance with the certificate holder's approved minimum equipment list (MEL) procedures.

Development And Sequencing Of Checklist Items.

FOI's must ensure that checklists are developed from a careful task analysis and are consistent with the procedures section of the operator's flight manual. Phase checklist items must be in an appropriate and logical sequence. When a checklist represents an abbreviated procedure, that checklist must follow the procedural sequence. FOI's should use the following additional guidelines concerning individual topics of checklist design.

A. Operators should standardize the sequence of checklist items as much as possible across aircraft types

B. When the operator has a choice as to where an item should be placed on a checklist, it should be placed at a point where the crew workload is lowest.

C. Operators should keep checklists as short as possible in order to minimize interruptions. When an operator is using an electronic checklist with the ability to automatically detect the completion of an action, the FOI shall encourage the use of that ability to the maximum extent possible.

(1) Operators should sequence checklist items to minimize interruptions of checklist accomplishment. For example, sequencing the "INS NAV MODE" as the first item on the engine-start checklist may allow the flight-crew to call for and complete the before-engine-start checklist at a convenient time even though INS alignment is not complete.

(2) Two short checklists may be preferable to a single long one. Operators may place a line or otherwise mark a checklist where the checklist can be held until a specific event occurs. This practice is acceptable because in essence, it creates two separate checklists.

D. Operators must include required pre-flight tests on checklists, but should design checklists to preclude the unnecessary testing of systems.

(1) Warning systems with built-in test and automatic monitor circuits do not need to be checked or included on checklists unless required by the AFM.

(2) Many test switches in the cockpit are designed for use by maintenance personnel. Operators should not require flight crewmembers to perform these tests as a normal procedure.

E. Operators must clearly identify decision point and indicate the correct alternative action or alternative sequence of actions to be taken after each decision point. If the effect of adverse weather requires an alternate action, the operator should design the checklist to account for that alternate action. For example, if the auto throttles are normally engaged for takeoff except when engine anti-ice is being used, the checklist should contain a requirement that the autothrottles cannot be engaged with the engine anti-ice on.

Immediate Action Items. Immediate action items are those items accomplished from memory by crew-members in emergency situations before the checklist is called for and read.

A. A flight-crew's failure to correctly accomplish all immediate action items can result in a threat to continued safe flight. For example, should a flight-crew fail to close the tank valve during an engine fire procedure, leaking fuel in the engine pylon may be ignited. In such cases, the first items on the corresponding checklist must be a verification that each immediate action item has been accomplished.

B. In some cases, an immediate action procedure may not be incorporated in a checklist. For example, there is no point verifying that each item of an aborted takeoff procedure has been accomplished after the aircraft has been brought to a stop. In most cases, however, there should be a "follow-on" or "clean-up" checklist to be accomplished after the situation has been brought under control.

C. Another example of an immediate action memory item is the following statement: "All flight crewmembers shall immediately don O2 masks and report to the captain on interphone in the event of loss of cabin pressure." In this example, the loss-of-cabin-pressure checklist would contain the immediate action memory item and subsequent follow on items to verify that each item has been accomplished.

Checklist Terminology. FOI's should ensure that the operator's aircraft checklists contain terminology that is tightly controlled to ensure clarity and common understanding. The following recommendations should be considered by FOI's when reviewing checklists.

A. The challenges and responses on the checklist should be consistent with the labelling on the switches and controls in the cockpit.

B. Terms such as "tested," "checked," and "set" are acceptable terms only when they are clearly defined and consistently used.

C. Operators should have a consistent policy concerning responses to items with variable settings. “As required” may be printed on the checklist, but should not be an authorized response. A response that gives the actual setting is normally appropriate. Items that require variable responses should be carefully evaluated. Such items may not actually be required on the checklist or may be more appropriately included in the system management portion of a checklist.

D. Responses to checklist items concerning liquid or gas quantities should be made in terms of the actual quantities on board compared to the specific quantity required, for example: “10,000 pounds required, 10,400 on board.” When specific quantities are required, a response of “checked” is not acceptable. A response of “checked” is acceptable when a range of quantity is permitted and the range is marked on an indicator, such as a green arc on an oil quantity gauge.

E. Excess verbiage on checklists should be discouraged. For example, a checklist item of “Reduce airspeed to 130 KIAS for best glide” can be abbreviated as “BEST GLIDE 130 KIAS.”

F. Ambiguous verbiage on checklists is not acceptable. For example, “takeoff power” can mean either to advance the power or to retard the power.

Aircraft Differences.

FOI’s shall ensure that operators account in the aircraft checklists for differences in various series of aircraft or in installed equipment. When there are only a few minor differences, this may be accomplished by using symbols to designate those checklist items that apply to only one series of airplanes or that apply only when the equipment is installed. When there are a significant number of differences, operators should prepare separate checklists for each series of aircraft. Policies and procedures should be established to account for differences in checklist responses when operations are conducted with equipment removed or inoperative, in accordance with MEL’s and configuration deviation lists (CDL).

Sequencing Normal Checklists And Other Checklists.

Normal checklist items may be incorporated in non-normal or emergency checklists to simplify cockpit management. An acceptable alternative method is to require both the normal and non-normal or emergency checklists to be accomplished in a specified sequence. This method has the advantage of allowing the normal checklist to be requested and accomplished at the time that it would normally be accomplished. Checklists should be designed so that two checklists are not in progress simultaneously. The method may depend on the degree of sophistication of the airplane involved. In technologically advanced aircraft with short, simple checklists, it is usually preferable to keep the normal and the non-normal checklists separate. Some non-normal checklist actions may be deferred until initiation of the appropriate normal checklist. In airplanes with electronic checklists, checklists may be combined based on the priority of any one action, and/or the deferred non-normal checklist items may be automatically inserted in the appropriate normal checklist. In older airplanes, however, it may be necessary to add the normal checklist items to the nonnormal or emergency checklist simply to keep the checklist manageable.

Checklist Format.

FOI’s shall ensure that operators present checklists to flight-crews in a practical and usable format. FOI’s should use the following guidance when evaluating aircraft checklists for proper format.

A. Paper checklists should be protected either by plastic lamination or by being printed on heavy, folded pasteboard stock.

B. Non-normal, alternate, and emergency checklists must be in a format that allows crewmembers to quickly and accurately find the correct procedure while the crewmember is under stress. To expedite the referencing of these checklists, a tabbed manual or other quick reference format is recommended. When a paper checklist is required on the airplane, the methods used in an electronic checklist and the associated paper checklist for referencing a particular checklist shall be sufficiently similar to minimize flight-crew confusion or inappropriate flight-crew response. The methods for accessing electronic checklists may determine the format used to reference checklists in the paper version.

C. For single-pilot aircraft, the before-takeoff checklist and before-landing checklist can be appropriately presented as placards on the instrument panel.

D. The type size and contrast used on a checklist is a compromise. A large type size is preferred for legibility. A small type size is preferred to keep the number of checklist pages to a minimum, which then further ease the locating of a specific checklist. The legibility of printed material depends on the size of the letters, the spacing between letters, and the type of font used. The following is offered as a suggestion to FOI's for what to consider in evaluating the legibility of checklists. This guidance must not be interpreted as being the only acceptable print size and contrast that can be used for checklists:

- Checklist headings or titles—12 point type, all caps, boldface, and a plain (sans serif) font
- Checklist text (challenge and response) and notes—10 point type, boldface, and a plain (sans serif) font
- Contrast for headings or titles—either black print on white or reversed for emphasis
- Contrast for text—black print on white
- Colored borders for ease of identification—green for normal checklists, yellow for non-normal checklists, and red for emergency checklists

NOTE: On airplanes with electronic checklists, these selections should be consistent with the display and symbology standards used by that system.

REVIEWED & VALIDATED BY:		
SIGNATURE OF SENIOR MANAGER: FOD	**NAME IN BLOCK LETTERS**	**DATE**
APPROVED BY:		
SIGNATURE OF EXECUTIVE MANAGER: ASO	**NAME IN BLOCK LETTERS**	**DATE**

END